Arthroscopic Scaphoid 3D Test for Scapholunate Instability

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Abstract

Background Patients with scapholunate instability usually have pain in the dorsal wrist. This pain may occur due to the impingement between the scaphoid and the dorsal rim of the radius when the scaphoid is detached from the lunate. This pain appears as the scaphoid is displaced over the dorsal rim of the radius. The arthroscopic scaphoid 3D (dorsal, dynamic, displacement) test is described here to check this pathologic dorsal displacement of the scaphoid.

Surgical Technique The test should be performed both in the radiocarpal and midcarpal joints. Traction is released and the arthroscope is set under the lunate when tested in the radiocarpal joint and on the lunate when tested in the midcarpal joint. The scaphoid is manually pushed dorsally at the scaphoid tubercle. If there was no scapholunate instability, all the proximal row bones are minimally displaced: a negative test. If there was scapholunate instability, the scaphoid is displaced dorsally while the lunate remains static: evaluated as positive.

Clinical Relevance This test can add information to the arthroscopic classifications of the scapholunate instability, which explore both the proximal to distal displacement of the scaphoid (the step-off) and the ulnar to radial displacement (the gap), as this test explores the volar to dorsal displacement.

Keywords
- scapholunate instability
- scapholunate ligament
- wrist arthroscopy
- carpal instability

The step-off and the gap formation between the scaphoid and lunate or the location of the ruptured scapholunate ligament may indicate the scapholunate instability in the arthroscopic classifications.[1–3] Patients with scapholunate instability usually indicate pain in the dorsal wrist that may occur due to the impingement between the scaphoid and the dorsal edge of the radius when the scaphoid is detached from the lunate (►**Fig. 1**). In fact, pain appears when the scaphoid is displaced over the dorsal edge of the radius during Watson's test,[4] a ballotment test, or in hyperextension of the wrist.[5] This dorsal impingement will develop into degenerative changes in the proximal pole of the scaphoid and dorsal rim of the radius, so-called a scapholunate advanced collapse 1 (SLAC-1) wrist.[6] This paper describes a test called "arthroscopic scaphoid 3D (dorsal, dynamic, displacement) test" that can be used to evaluate the pathologic dorsal displacement of the scaphoid in scapholunate instability (►**Fig. 2**).

Technique

The test should be performed either in the radiocarpal joint or midcarpal joint first, then in the other joint next (►**Fig. 3**).

Test in the Midcarpal Joint

The arthroscope is introduced through the ulnar midcarpal portal and set over the lunate. Then, traction from the finger traps is released and the scaphoid is pushed dorsally at

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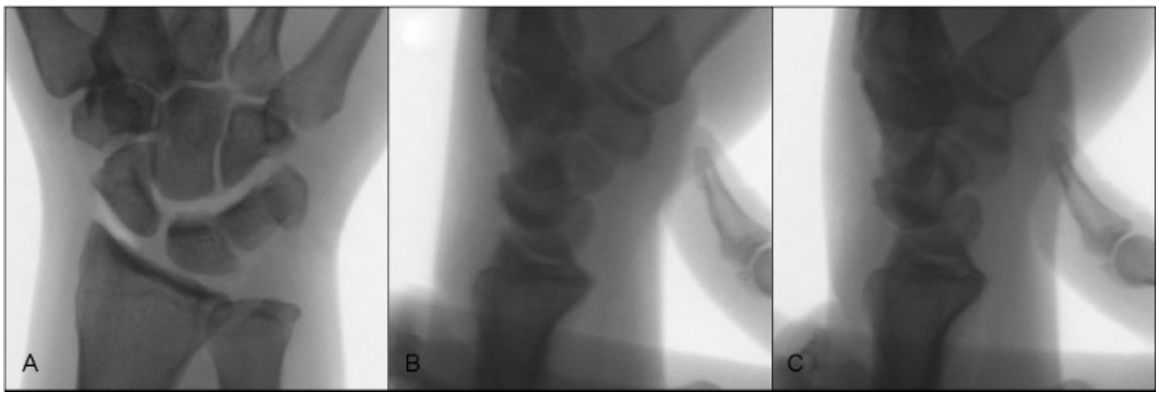

Fig. 1 Patient with a complete rupture of the scapholunate ligament. **(A)** PA X-ray. **(B, C)** Lateral X-ray: The scaphoid is displaced over the dorsal rim of the radius when displacement force is dorsally applied on the scaphoid, while the lunate remains in the lunate fossa. There is an impingement between the dorsum of the radius and the scaphoid.

the scaphoid tubercle. If there is no scapholunate instability, the proximal row moves dorsally as the scaphoid is correctly attached (a negative test). If there is scapholunate instability, the scaphoid moves dorsally while the lunate remains in the same position (a positive test).

Test in the Radiocarpal Joint

The arthroscope is introduced through the 6R portal and located under the lunate. Without traction, the scaphoid is pushed dorsally. If there is no scapholunate instability, the proximal row moves dorsally (negative test), but if there is a scapholunate instability, the scaphoid is displaced over the dorsal rim of the radius, while the lunate remains static (positive test). A hemorrhagic dorsal synovitis was commonly seen between the scaphoid and radius (►**Video 1**).

Video 1

Arthroscopic scaphoid 3D test. Online content including video sequences viewable at: www.thieme-connect.com/ejournals/html/doi/10.1055/s-0037-1601578.

Discussion

The arthroscopic scaphoid 3D test may offer additional information to the arthroscopic classifications of the scapholunate instability. When the scapholunate instability is explored arthroscopically, there is the step-off or the gap formation

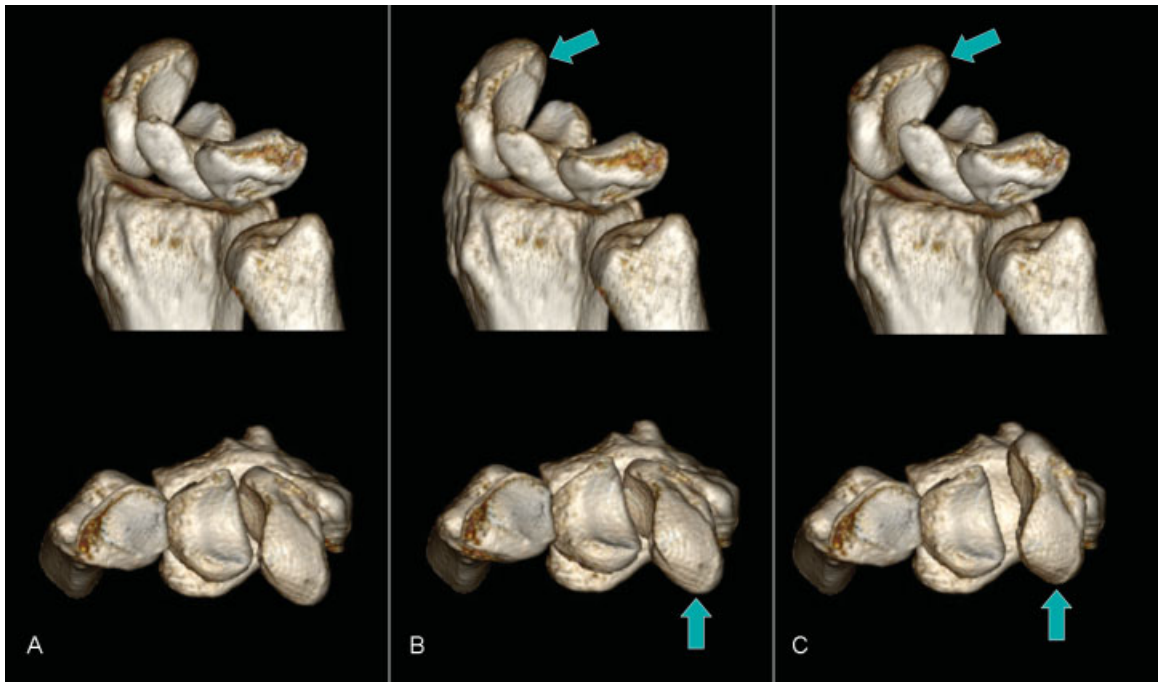

Fig. 2 (**A**) Right wrist at rest. Above: Oblique dorsal view. Below: zenithal view. (**B**) Negative arthroscopic 3D test. When pushing the scaphoid, the proximal row moves together. (**C**) Positive arthroscopic 3D test. When pushing the scaphoid dorsally, the scaphoid is displaced over the dorsal rim of the radius while the lunate remains static.

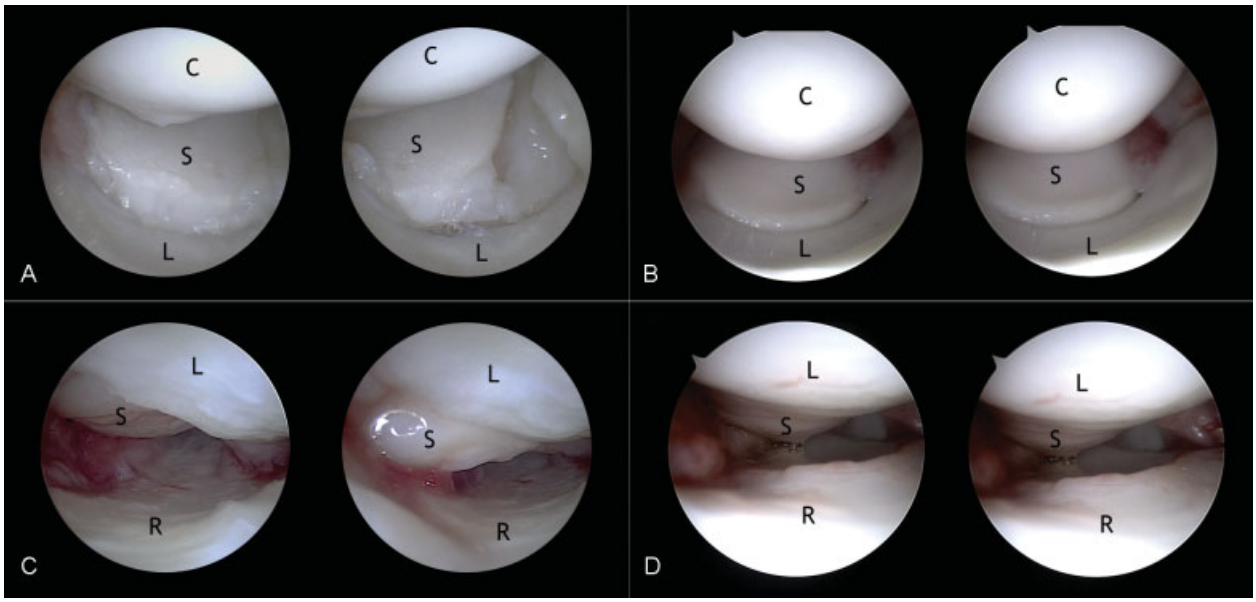

Fig. 3 (**A**) Right wrist, view from the ulnar midcarpal portal. When performing the test, the scaphoid is displaced dorsally, while the lunate remains static (positive test). (**B**) Right wrist, view from the ulnar midcarpal portal. When performing the test, the scaphoid is not displaced dorsally (negative test). The whole proximal row moves in the same dorsal direction. (**C**) Right wrist, view from the 6R portal. When performing the test, the scaphoid is displaced dorsally (positive test). There is an impingement between the scaphoid and radius; the dorsal synovial tissue is hemorrhagic as it is caught in two bones. (**D**) Right wrist, view from the 6R portal. When performing the test, the scaphoid is not displaced dorsally (negative test). The whole proximal row moves dorsally.

between the scaphoid and lunate. These are essential to define the degree of the instability. We consider that the dorsal displacement of the scaphoid should also be evaluated, because it may be a cause of the pain in the dorsal wrist. The dorsal translation of the scaphoid may develop a hemorrhagic dorsal synovitis in early stage of the scapholunate instability or a lax ligament and degenerative changes in the dorsal radius and proximal pole of the scaphoid in advanced stages (SLAC wrist).

Conflict of Interest
None.

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